ATC Airspace Description for Data Exchange

Working Group Terms of Reference

Background

The ATC (Air Traffic Control) Airspace Description for Data Exchange working group (AIRDEMWG) is chartered to develop a model for representing and exchanging ATC airspace information between systems and tools that display, analyze and transform ATC airspace. In this context, ATC airspace refers to airspace defined and under the control of an air traffic controller.

The purpose of this working group is not to dictate the internal representation of airspace data or tool, but rather to describe standards for exchanging this information between tools or systems. To that end, the objective of the working group is to develop a relatively simple representation of ATC Airspace that meets the functional requirements for data exchange.

The basic characteristics of the data model include:
- An Extensible Markup Language (XML) for representing the ATC Airspace data elements
- Data schema that encompasses current ATC sectorization and special use airspace construction

A common element of any air traffic control (ATC) system is the concept of airspace, the entity in which aircraft are monitored and controlled by the air traffic controller. Within the Federal Aviation Administration (FAA), the fundamental operating unit of ATC is the sector. Air traffic within each sector is monitored and adjusted by a team of air traffic controllers.

Within the FAA Air Route Traffic Control Center (ARTCC), the HOST software *adapts* airspace using a hierarchy of nodes, modules, fix post areas (FPAs) and sectors. A similar structure can be found within the terminals and TRACONS (Terminal RADAR Approach Controls). Furthermore there is a need to define Special Use Airspace (SUA) such as Military Operating Areas (MOAs) and restricted areas that are operating under special ATC rules.

Beyond the operational needs, many decision support tools use their own logical and physical models for representing airspace. In the past, the Sector Design and Analysis Tool (SDAT) has followed the ARTCC schema. Other tools like the Total Airport and Airspace Modeler (TAAM) have used different approaches. The purpose of the ATC Airspace Description for Data Exchange working group (hereafter termed the working group) is to define a unified model representing ATC airspace for exchange between

operational and post-operational systems. The goal is to develop a standard that can be used to transfer ATC airspace data between tools. Figure 1 shows the domain that the ATC Airspace Model for Data Exchange is working within. As shown in the diagram, the purpose of this working group is to develop a standard for communicating and exchanging basic ATC airspace elements.
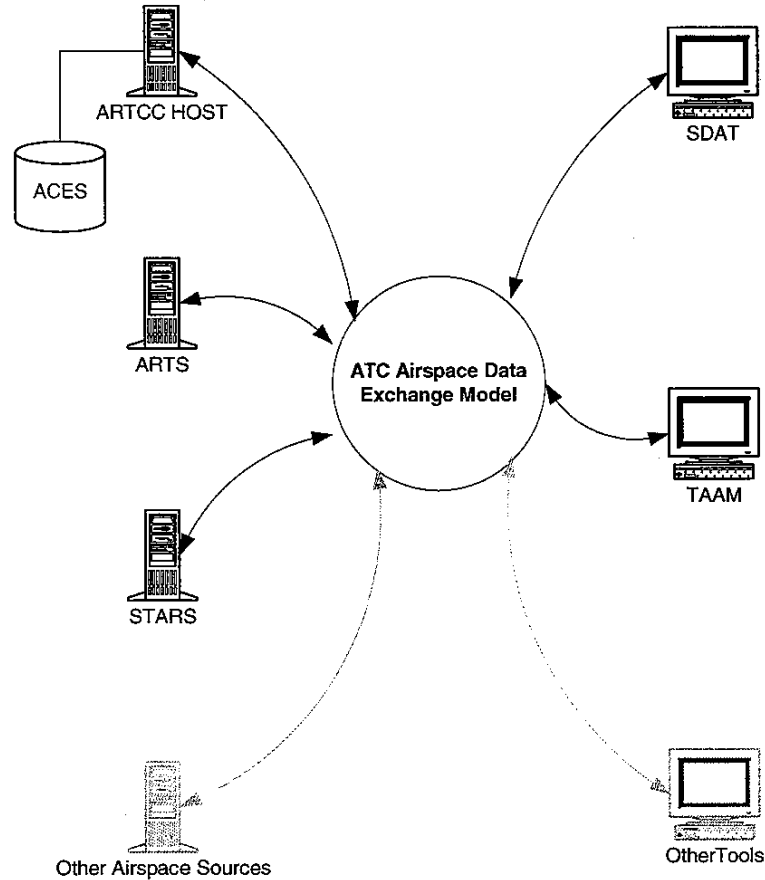

Figure 1: Domain of the ATC Airspace Model data exchange-working group

A standard format in which airspace is identified and organized responds to Recommendation 1.8.3 of the White House Commission on Aviation Safety and Security. This recommendation directed the FAA to "work with the aviation community to develop standard databases of safety information that can be shared openly."

The development of a single standard for exchanging data related to airspace aids in air traffic control as well as airspace design and analysis. By providing a standard for exchange it should be possible for operational systems and decision support tools to easily share and exchange airspace data. This will improve the efficiency of design activities and could result in a more rapid integration of design efficiencies into the National Airspace System (NAS).

A variety of functional areas need access to a standard model for representing and exchanging airspace data:
- FAA ARTCCs and RAPCON (RADAR Approach Control)
- FAA ATC terminals and TRACONS
- Airspace modelers and designer
- Airspace operational and post-operational tools

A variety of organizations have a stake in the development of a standardized airspace representation:
- Airspace management organizations within the FAA (e.g., ATA, ATP)
- Aviation industry consultants
- Air traffic control providers
- Aviation application developers

A uniform standard for airspace data exchange will:
- Eliminate the complexity of importing, consolidating and reconciling airspace data from multiple systems.
- Promote a common vocabulary for expressing airspace concepts within the context of ATC
- Increase the conformity of airspace design and analysis across tools and across organizations
- Provide a framework for managing the development and organization of new airspace related data.

Scope

The scope of this effort is limited to develop a standard logical data model and transmission standard for exchanging ATC airspace data between aviation systems and/or organizations. The effort will be limited to developing a standard based on existing airspace concepts.

At a minimum the following types of airspace will be considered within scope:
- ATC sectorization
- Special Use Airspace (SUA)
  o Military Operating Areas (MOAs)
  o Restricted areas
  o Air Defense Zones
  o ATCAs (ATC Advisory Areas)
  o And other airspace entities that define and segregate regions of airspace for the purposes of air traffic control

At a minimum, the working group will consider airspace representations used in the following systems and tools:
- ARTCC HOST
- Standard Terminal Area Replacement System (STARS)
- SDAT

- TAAM
- MEARTS (Micro-Enhanced Automated Radar Terminal System)
- NASR (National Airspace System Resources) database

Action plan

The ATC Airspace Description for Data Exchange working group may complete the following tasks:

- Determine if additional FAA stakeholders should be contacted for information related to the ATC Airspace data exchange model
- Compare the proposed data exchange model to existing data exchange standards proposed by the ICAO Common Taxonomy
- Review the airspace representations used in FAA operational environments as well as FAA tools to validate this model's completeness
- Evaluate this Working Group's efforts in the larger context of FAA data standardization to identify and resolve overlaps or differences (This includes resolving overlaps between this work and existing standards previously approved in previous NIAC case files that were submitted to the NAS Configuration Control Board (CCB).)
- Identify the FAA office that will maintain configuration management of the ATC Airspace Description for Data Exchange model.
- Create and register meta-data to describe the airspace elements defined by the Working Group.
- Provide any additional information required by the NIAC and the NAS CCB.

Product Schedule

January 2002	Submit the baseline standard to the FAA Data Registry (FDR) or other data registry system as designated by the NIAC or NAS CCB to initiate the Airspace Definition for Data Exchange Working Group.
March- April 2002	Review and revise the baseline standard by the working group members
April- June 2002	Submit interim case files defining airspace elements
July 2002	Coordinate final approval of airspace element submissions to the NIAC and the NAS CCB for approval.

Working group membership

Brett Brunk (chairman)	CNAC supporting ATA-40
Harold MacLennan	Unitech supporting ATA-40
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Approvals

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